CUB CREEK BRIDGE
Yellowstone Roads and Bridges
Spanning Cub Creek on
East Entrance Road
Yellowstone National Park
Park County
Wyoming

HAER No. WY-25

HAER
WYO
15-YELNAP,
2-

BLACK & WHITE PHOTOGRAPHS

REDUCED COPIES OF MEASURED DRAWINGS

WRITTEN HISTORICAL & DESCRIPTIVE DATA

XEROGRAPHIC COPIES OF COLOR TRANSPARENCIES

Historic American Engineering Record
National Park Service
U.S. Department of the Interior
P.O. Box 27377
Washington, DC 20013-7127

Rocky Mountain Regional Office
National Park Service
U.S. Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

HAER
WYO
15-YELNAP,
2-

HAER WY-25

HISTORIC AMERICAN ENGINEERING RECORD

CUB CREEK BRIDGE
~~HAER WY-25~~

Location:	Spanning Cub Creek on East Entrance Road, 12.5 miles west of the eastern park boundary, Yellowstone National Park, Park County, Wyoming UTM: Pelican Cone, WY, Quad. 12/564000/4928000
Date of Construction:	1928
Designer:	Bureau of Public Roads
Builder:	Morrison-Knudson, Boise, Idaho
Owner:	Yellowstone National Park, National Park Service
Use:	Vehicular bridge
Significance:	Cub Creek Bridge typifies the early design philosophy of the National Park Service, which was to use indigenous materials to harmonize man-made features with their natural surroundings. This philosophy is embodied in many of the park's Rustic Style buildings and structures. Cub Creek Bridge was the first bridge constructed in Yellowstone as a joint effort between the National Park Service and the Bureau of Public Roads.
Project Information:	Documentation of Cub Creek Bridge is part of the Yellowstone Roads and Bridges Recording Project, conducted during the summer of 1989 by the Historic American Engineering Record, a division of the National Park Service, under the co-sponsorship of Yellowstone National Park, the NPS Roads and Bridges Program, and the NPS Rocky Mountain Regional Office, Denver. Historical research and written narrative by Mary Shivers Culpin, Historian, NPS Rocky Mountain Regional Office. Engineering description by Steven M. Varner, Virginia Polytechnic Institute. Edited and transmitted by Lola Bennett, HAER Historian, 1993.

HISTORY OF EAST ENTRANCE ROAD

In 1872 approximately 2,500 acres were set aside in northwestern Wyoming Territory as America's first national park, Yellowstone. The authorizing legislation stated that the park should be "set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people." Thus, the first superintendent, Nathanial P. Langford, conceived the idea of a circuit road which, combined with good wagon approach roads, would enable visitors to reach the scientific and scenic wonders of Yellowstone.[1]

The need for construction of a road system remained a top priority with the first superintendents, but it took six years before Congress appropriated funds for any improvements in the park. The first wagons entered Yellowstone in 1877 with one having to be disassembled before it could be taken over the only bridge, Baronett Bridge. Prior to that time, and for many years hence on many of the routes, only pack-trains could manage the park roads.

By the end of 1882, 104 miles of the 140-mile circuit system had been completed; however, the general quality of the roads was poor due to lack of sufficient funds and over-ambitious planning. In 1883 the U.S. Army Corps of Engineers assumed road construction responsibility from the civilian superintendent who was under the direction of the Secretary of the Interior. The Army Corps' involvement with the road program in Yellowstone lasted for thirty-four years. Fortunately, the engineering officers who had the most influence on the road projects, Dan Kingman and Hiram Chittenden, developed a philosophy which called for harmonizing man-made features with the landscape. This landscape ethic was expanded in later years by landscape architects of the National Park Service.

Appropriations for East Entrance Road were approved June 6, 1900, and March 3, 1901, with work beginning July 1, 1901, under the direction of Captain Hiram Chittenden. After careful inspection of the two possible routes, Jones Pass and Sylvan Pass, both of which were considered "excessively difficult," the Sylvan Pass route was chosen. Several reconnaissance surveys made on the Sylvan Pass route discovered immense physical obstacles, but Captain Chittenden favored the selection because, "The pass is one of great scenic beauty and will be an important addition to the attractions of the Park." The lower (1000') elevation of this route over the higher Jones Pass route was also factored into the selection.[2]

With the termini of the route, the outlet of Lake Yellowstone and a point where the east entrance boundary crosses the Shoshone River, predetermined, the survey proposed a route which left a point one-quarter mile below the lake outlet in a straight line over flat ground through a forested area to Pelican Creek Valley. From that point the road went along the north bank of Indian Pond (also known for a number of decades as Squaw Lake) and on the west shore of Turbid Lake, crossing over a low pass east of Lake Butte between Bear and Cub creeks. After crossing Cub Creek, above the hot springs, the road follows the slope of the hills that divide Cub Creek and Clear Creek valleys. On either side of Cub Creek, the road offered very good views of Lake Yellowstone. The route then ascends Clear Creek Valley on the creek's north bank to Sylvan Lake.

Chittenden described the area in his report for 1901: "This place is one of scenic attractions unsurpassed in any part of the mountains. Sylvan Lake is a small but exceedingly beautiful sheet of water near the summit of the pass, which is about two miles farther east." From Sylvan Lake to the Pass, the road then traverses very difficult natural conditions for the pass is very narrow. Captain Chittenden called it "unique among mountain passes in that it is almost entirely loosened from the cliffs on either side by the action of frost. This broken rock varies in size from fine pebbles to pieces a cubic yard in volume."[3] From the top of the pass, the route descended on an extreme grade down into the valley of the North Fork of Middle Creek for approximately four miles to the junction with the main creek. From that point the survey

suggested that the route follow along the north bank of Middle Creek to its junction with Shoshone River, approximately seven miles east.

Despite natural obstacles, such as excessively steep slopes, unstable ground, prevalent avalanche and landslide conditions, and huge boulders in the route, Captain Chittenden believed the scenery along the valley was "on the highest scale of grandeur and sublimity," and that this outweighed any obstacles.

During the first construction season, the crews cleared a swath 30' wide and 12.3 miles long, from the lake outlet to a point three-quarters of a mile from the Cub Creek crossing. A total of forty-one acres was cleared and in most cases the timber was removed out of sight of the roadway. Grading from the lake outlet to near Indian Pond and on to the top of a ridge south of Turbid Lake, thus providing a passable road 9.6 miles in length. The grading project also included construction of a causeway across Pelican Flats, which was 1,500' long, 18' wide, and 3'-6" high. An approach to Yellowstone River, 18' wide and 4' high, with cribbing to the top, was also part of the project. Some road projects were slowed due to the crews being pulled for two weeks of fighting forest fires.[4]

Early in the planning stage, a ferry site was chosen on Yellowstone River, one-quarter mile from the lake outlet. Pile and timber approaches, which extended 2' on either side of the water line, were constructed in a position to point downstream at an angle of 3 degrees to the norm of the current. Later, construction began on a 360-foot pile bridge with earth approaches. The average penetration of the driven piles was 7'. In order to provide access for boat passage and to avert a heavy embankment on the eastern approach, the bridge's center was raised approximately 3' above the ends giving it a curved profile. The bridge was completed in 1902. The other substantial bridge completed that year was another pile bridge, 192' long, over Pelican Creek. In addition to these two bridges--described by Chittenden as "plain structures,"--the crews, under the supervision of Assistant Engineer S.F. Crecelius, built six other bridges over streams between Turbid Lake and Sylvan Pass, the longest of which spanned Cub Creek.[5]

The road opened to the public on July 10, 1903, but the excessively steep slope east of Sylvan Pass remained an important piece of unfinished work. In 1905 several wooden bridges were built along the route, including one over Grinnell Creek. The following year, a 150-foot wooden viaduct was completed on a difficult section east of Sylvan Pass. Chittenden described the viaduct as the means "by which the road down the mountain on the east side of Sylvan Pass is made to pass over itself in order to secure the necessary reduction in grade."[6]

In addition to the 1909 construction of a new bridge at Turbid Lake and the construction of a 25-foot timber bridge at an unnamed location on the East Entrance Road in 1913, not much new construction was undertaken until 1916-17.[7] By 1917 the wooden viaduct east of Sylvan Pass was replaced by a 60-foot wooden bridge with a large rock fill at the west abutment. Pelican Creek Bridge was partially refloored and many of the smaller bridges along the route received lesser repairs. Some widening and grading was done, as well as the installation of numerous galvanized-iron culverts.[8]

The park received the first road paving appropriation for the Grand Loop in 1917; however, most of the money was returned to the treasury as a result of the United States entry into World War I. Soon after the end of war, automobile travel to the park increased tremendously, from 5,703 automobiles in 1917 to 10,737 automobiles in 1919. This increase in traffic necessitated further road improvements.[9] In 1923 seven miles of road were widened and three miles were surfaced.[10]

During 1924 and 1925, there was much debate over the advantages and disadvantages of the Bureau of Public Roads taking over the responsibility of road improvement and construction in the national parks. However, everyone agreed that the East Entrance Road from the lake outlet to the East boundary would need complete reconstruction on most segments. A 1925 estimate for

the reconstruction project was approximately $400,000.[11]

In 1926 the Bureau of Public Roads (BPR) reached a working agreement with the National Park Service and construction of East Entrance Road became one of the first projects under the new arrangement. As part of the agreement, the BPR would provide all of the technical expertise and the National Park Service landscape architects would provide the design and special treatments pertaining to landscape architecture. The National Park Service and the BPR worked closely to ensure that the roads and related structures would intrude as little as possible on their natural surroundings.

The 1927 survey between Sylvan Pass and Fishing Bridge suggested that the new road be relocated to take advantage of higher vistas including the Grand Teton in addition to the elimination of many sharp turns and curves.[12] During July 1928 the contractor, Morrison-Knudsen Company of Boise, Idaho, completed different stages of clearing, grubbing, grading, and surfacing. Cement rubble headwalls were installed by a masonry crew of one stone mason and two helpers.[13] The mason's work also included construction of Cub Creek Bridge.

On September 2, 1928, a heavily-loaded and miscalculated shot went off, causing significant damage to the standing timber on the hillside and even onto the opposite side of the canyon. Immediate cleanup was ordered, and the engineers issued stringent changes to the specifications.[14] The crews finished the 1928 construction season with more cleanup, plowing portions of the old 1901 road, dressing of the borrow pits, and putting finishing touches on areas as requested by Superintendent Albright and the park landscape architect.[15]

The following construction season, blasting procedures were carried out in a more careful manner and precautions were taken to protect passing traffic and to reduce inconvenience to visitors. Between 7 p.m. and 7 a.m., the east entrance gate and a barricade at Fishing Bridge were padlocked to prevent nighttime travel. During the working hours, flagmen used a signal system at potential dangerous points. Extensive settlement occurred over the winter on the completed Cub Creek section. In one case the road settled as much as 3'-6", and minor sliding occurred in several places.[16]

Construction work--mostly grading, drainage and some surfacing--during the 1929 season concentrated on the eastern half of the road between Sylvan Pass and the East Entrance. Grading on East Entrance Road was considered by BPR officials to be "one of the heaviest, per mile, grading jobs that will be had in Yellowstone and one which involved greater traffic hazards and difficulties than will usually be expected".[17] The mason and his crew completed cement rubble masonry work on the concrete box culverts, and corrugated metal pipe culverts were installed as the drainage work demanded.[18]

Surfacing the segment continued for the next few construction seasons. In 1934 construction began on Pelican Creek Bridge and Sedge Creek Bridge.[19] By 1935, all but one-half mile of the 26-mile East Entrance Road had been completed. In the remaining section, the approaches to Fishing Bridge were completed and opened to travel on August 1, 1937.[20] By that time, East Entrance Road was the most heavily-traveled road in the park, with 50,176 vehicles using it annually. The second heaviest volume of traffic was on the Lake Junction to Canyon segment with 43,645 vehicles annually.[21]

During the 1939-40 season, the road received a 6-inch base course of crushed rock and gravel and a 2-inch top course of dense graded plant mix bituminous surfacing with a stone chip cover coat to the width of 22' with 1-foot shoulders. A short realignment was made at Steamboat Point to move the existing road off a thermal area to solid ground. The crushed rock used in the surfacing material came from flattening out slopes on Sylvan Pass; the medium quality bank gravel and the good quality lake shore gravel for aggregate came from two nearby pits. The binder material, which came from a pit near Sylvan Lake, was mixed with rock from Sylvan Pass and from a roadside cut at the east entrance to the spur road for Lake Butte.

The top course, which had been stockpiled and dried, was mixed with MC-3 outback asphalt at a Madson stationary mixing plant. The mixture was then spread by paving machine at an average temperature of 200 degrees Fahrenheit and was rolled with a 7-ton roller approximately three hours after being spread, and again the second day. Traffic flowed on lane after the first rolling. After four to five weeks, the seal coat and a final layer of stone chips were applied then rolled with a 8- to 10-ton roller. The road was opened to traffic twenty-four hours after the last rolling. In addition to the surfacing, new parking areas, including a very large area just west of Fishing Bridge were constructed.

The contractor, Taggert Construction Company of Cody, Wyoming, brought the equipment and supplies in from Cody, as well as obtaining the asphaltic material from Cody area refineries. No great difficulties were encountered on this two-year project and no major accidents occurred. Most of the skilled laborers were hired from the Cody area; in 1939, the unskilled laborers were hired from the National Reemployment Service office at Mammoth Hot Springs and in 1940, from the National Reemployment Service office in Cody. The 74-man crew was based at a camp located one-half mile north of Fishing Bridge and used the National Park Service mess hall at the lake and the contractor's at Pelican Creek.[22]

In the spring of 1941, Wyoming Congressman John J. McIntyre requested the National Park Service to consider keeping East Entrance Road open all year. The Acting Director of the Park Service responded that a 1940 study examined the feasibility of keeping park roads open during the winter, but high costs and severe weather conditions, coupled with the small number of winter visitors, compelled the National Park Service to close the park to winter travel.[23]

U.S. entry into World War II brought major road projects to a halt, and it wasn't until the 1950s, and Mission 66, that East Entrance Road underwent any major work. Up until 1960, $2,567,000 had been spent on the 26-mile East Entrance Road and 4 miles of parking area. In 1961 $8,343.46 was spent on bridge work and improvement. In 1962 $42,698.84 was spent on resurfacing, replacement of 1,540 feet of guardrail and work around Indian Pond.[24]

In 1963 a location survey was completed for the segment of East Entrance Road beginning at a point 1,000 feet west of the Sylvan Pass summit to the east boundary of the park and also including an 850-foot connection to U.S. Highway 14 and U.S. Highway 20 in Shoshone National Forest. In November 1964, the contract was awarded to Cave Construction, of Great Falls, Montana. Work began on July 1, 1965, with clearing, excavating and constructing embankments. Crews excavated using 966 Caterpillar front-end leaders, Euclids, dump trucks and bulldozers. Tractor-drawn sheepsfoot or vibratory rollers were used for compacting the subgrade and base course, with water obtained from Middle Creek with the assistance of a portable water plant and tank trucks.

Material for the base course came from a talus slope south of Sylvan Pass summit. The placement of the bituminous preservative treatment was completed on August 18, 1966. In addition to road surfacing, 4,550 linear feet of 18-inch trench was dug for an underground telephone cable. Corrugated metal pipes, 18" to 30" in diameter, with concrete headwalls, drop inlets and metal end sections were installed to aid surface drainage. Two of the existing culverts at Stations 221.80 and 296.80 were enlarged by using 10'x5'-3" structural plate arch pipes. Before the project ended, some grading, realignment and widening of the existing road and construction of a new entrance station and several parking areas were completed. The engineers reported "no unusual engineering problems" during the project. The total cost of the project excluding the utility work amounted to $687,935.39. The work crews, who mostly came from the area, lived in trailer houses outside of park, near Holm Lodge.

At the conclusion of the project, the engineers recommended a contract for reshaping and permanent surfacing of the old roadway, which had received damage from the heavy construction traffic. The engineers considered the old road to be in hazardous condition.[25] In 1968,

$847,078.11 was spent on the same section of road and on 8.053 miles of parking. In 1969, $2,954.77 was spent on the same section. In 1970 $348,827.02 was spent on shoulder improvements and in 1976, $631,401.02 was spent on bituminous surfacing of previously constructed section from the East Entrance to Sylvan Pass. In 1983 $132,497.00 was spent on replacing the cable guardrail and in 1987, more guardrail work was completed for an a cost of $1,906.10. As of 1987, a grand total of $4,422,406.76 had been spent on the East Entrance Road. Extensive repairs were made to 2,430 linear feet of masonry guardrail east of Sylvan Pass. Approximately 2,290 linear feet of wooden guardrail was replaced, including the rails on Pelican Creek and Sedge Creek Bridges.[26]

In 1986 the Parkwide Road Engineering Study of East Entrance Road divided the road into three segments. The first segment, which begins at the Junction with the Grand Loop Road and ends approximately 9.50 miles east at the junction with Lake Butte Overlook Road, is 26' wide, shoulder-to-shoulder. The pavement width is 22' and is surfaced with a bituminous plant mix. The shoulder condition was considered poor and the surface condition of the roadway was considered fair to poor. This segment has three historic bridges on it: Fishing Bridge, Pelican Creek Bridge, and Sedge Creek Bridge.

The second segment, which begins at Lake Butte Overlook Road and ends 9.50 miles eastward to the summit of Sylvan Pass, is 24' wide shoulder-to-shoulder. The pavement width is 22' wide and is surfaced with a bituminous plant mix. The shoulder condition was considered poor and the surface condition of the roadway was considered very poor with severe rutting and subgrade failure in many areas. The only major structure on this segment is the Cub Creek Bridge.

The third and final segment, which begins at the summit of Sylvan Pass and ends 7.02 miles eastward at the east boundary of the park, is 28' to 36' wide shoulder-to-shoulder. The pavement width is 24' and is surfaced with bituminous plant mix. The shoulder condition was considered fair and the surface condition of the roadway was considered fair to poor. There are no major structures on this section.

The 1985 statistics indicate that approximately 3,700 vehicles traveled this road daily with a projection of 4,500 vehicles by the year 2005.[27]

DESIGN AND CONSTRUCTION OF CUB CREEK BRIDGE

The survey for Cub Creek Bridge was completed in the summer of 1926, and in November the Bureau of Public Roads submitted three possible plans for its construction Superintendent Horace Albright. Two of the designs called for the construction of a plain concrete barrel arch structure and the third plan called for a cambered flat arch structure. All three designs recommended a stone masonry veneer for the arch ring and spandrel walls and the wing walls.[28]

The design finally selected was for a single-span concrete arch with earth filled spandrels and stone masonry veneer, has a maximum length of 20'. The span length is measured from center of support to center of support. The deck width is 28'-5" while the bridge roadway, curb-to-curb, is 24'-5". The deck material is concrete with an asphalt covering.

The details of its construction did not go without close scrutiny of the landscape architects of the National Park Service. On a visit to the park in September 1927, the National Park Service's Chief Landscape Architect Thomas C. Vint wrote:

> This bridge has the appearance of being set too low into the ground but it is a situation which cannot, at the present time, be remedied. It is hoped that when they get their excavation completed, this

> condition will not be so apparent. No rock work had been done other than to have brought some of the rock to the bridge site. Men were working on the rocks to be used in the arch ring. This work as well as the type of rock appears to be very satisfactory.[29]

Vint suggested that tool marks be chipped off the mortar joints and that no attempt be made to recess the joints to a depth of 1" because of the change in color of the mortar. He advised the Bureau of Public Roads that on any future masonry work of that type, the joints were to be recessed to a depth of 1".[30]

ENDNOTES

1.The Organic Act, creating Yellowstone National Park, was approved on March 1, 1872.

2.Hiram Chittenden, *Report Upon the Construction, Repairs, and Maintenance of Roads and Bridges in the Yellowstone National Park and Construction of Military Road from Fort Washakie to Mouth of Buffalo Fork of Snake River, Wyoming and Erection of Monument to Sergeant Charles Floyd In the Charge of Hiram M. Chittenden, Captain, Corps of Engineers Being Appendices FFF, III, and JJJ of the Annual Report of Chief of Engineers for 1901.* (Washington D.C.: Government Printing Office, 1901), 3794.

3.Chittenden, pp.3780-82.

4.*Ibid, p.3794.*

5.Chittenden, *Improvement of Yellowstone National Park, Including the Construction, Repair and Maintenance of Roads and Bridges. (Annual Report of the Chief of Engineers for 1902), Appendix FFF.)* (Washington D.C.: Government Printing Office, 1902), p.3035.

6.Hiram M. Chittenden, Major and John Mills, *Annual Report Upon the Construction, Repair, and Maintenance of Roads and Bridges In The Yellowstone National Park and the Road Into Mount Rainier National Park; Survey for Wagon Road From Valdes to Fort Egbert, Alaska, and Survey for Military Trail Between Yukon River and Coldfoot, Alaska, Being Appendices FFF and DDD of the Annual Report of the Chief of Engineers for 1905,)* (Washington D.C.: Government Printing Office, 1905), p.2811.

Hiram M. Chittenden, Ernest Peek, John Mills, and Francis A. Pope, *Annual Report Upon the Construction, Repair, and Maintenance of Roads and Bridges in the Yellowstone National Park and the Road Into Mount Rainier National Park Being Appendices GGG and JJJ of the Annual Report of the Chief of Engineers for 1906.* (Washington D.C.: Government Printing Office, 1906), p.2255.

7.Wildurr Willing, and C.W. Kutz, *Report Upon the Construction, Repair, and Maintenance of Roads and Bridges in the Yellowstone National Park and Report Upon the Road Into Mount Rainier National Park Being Appendices GGG and HHH* (Washington D.C.: Government Printing Office, 1909), p.2510.

C.H. Knight, J.B. Cavanaugh, and Jay J. Morrow, *Report Upon the Construction, Repair, and Maintenance of Roads and Bridges In the Yellowstone National Park, Report Upon the Road Into Mount Rainier National Park. Report Upon Crater Lake National Park, Being Appendices EEE and FFF* (Washington D.C.: Government Printing Office, 1913), p.3269.

8.Stephen Mather, *Report of the Director of the National Park Service to the Secretary of the Interior for the Fiscal Year Ended June 30, 1917.* (Washington D.C.: Government Printing Office, 1917).

9.Secretary of the Interior Franklin Lane to Senator Francis Warren, 29 January 1920.

10."Proposed Road Projects for 1923." No author. No date.

11.Horace Albright, Superintendent, Yellowstone National Park to Stephen Mather, Director of the National Park Service, 29 July 1925.

12.*Sheridan Post Enterprise*, 30 October 1927.

13."Monthly Narrative Report, July 31, 1928, of Yellowstone National Park, District No. 3." File Box: Roads BPR, Yellowstone National Park Archives, Yellowstone National Park.

14."Monthly Narrative Report September 30, 1928, Yellowstone National Park, District No. 3." File Box: Roads BPR, Yellowstone National Park Archives, Yellowstone National Park.

15."Monthly Narrative Report, September 30, 1928, Yellowstone National Park, District No. 3." File Box: Roads BPR, Yellowstone National Park Archives, Yellowstone National Park.

16."Monthly Narrative Report, June 30, 1929, Yellowstone National Park, District No. 3." File Box: Roads BPR, Yellowstone National Park Archives, Yellowstone National Park.

17."Monthly Narrative Report, July 31, 1930, Yellowstone National Park, District No. 3." File Box: Roads BPR, Yellowstone National Park Archives, Yellowstone National Park.

18."Monthly Narrative Report, October 31, 1929, Yellowstone National Park, District No. 3." File Box: Roads BPR, Yellowstone National Park Archives, Yellowstone National Park.

19."Report to the Chief Architect through the Superintendent, Yellowstone National Park by Mr. Frank Mattson, Landscape Architect, Sept. 28 - Oct. 28, 1934."

Memorandum to C. Capes from Mr. Frank Mattson, Landscape Architect, 1 August 1935. R.G. 79. Yellowstone. File Box: 10, National Archives and Records Center, Denver, Colorado.

20.E.H. Cowan, Chief Engineer, Inspector-Superintendent, "Final Construction Report (1936-37) on Grand Loop 1-E1, Parking Area, and East Entrance (Fishing Bridge) 5-D1, part D2, Bridge, Approaches, Surface and Secondary Roads. Yellowstone National Park, Wyoming. U.S. Bureau of Public Roads, D-3." Loose Folder, Yellowstone National Park Archives, Yellowstone National Park.

21.C. Capes, "Traffic Survey Report Intra-Park Travel Season 1937, Yellowstone National Park, Wyoming, September 20, 1937." File Box: 13, Yellowstone National Park Archives, Yellowstone National Park.

22.E.H. Cowan, "Final Construction Report (1939-40) on Grand Loop National Park Project 1-E1, part F1, and East Entrance National Park Project 5-D1, D2, part C, Bituminous Surfacing Yellowstone National Park, State of Wyoming, March 11, 1941." File Box: Road System Reports 1931-1943, Yellowstone National Park Archives, Yellowstone National Park.

23.Acting Director, National Park Service, A.E. Demaray to Wyoming Congressman, John J. McIntyre, 22 April 1941.

24.Real Property Records for Yellowstone National Park, East Entrance Road, Rocky Mountain Regional Office, National Park Service.

25."Final Construction Report (1965-1966) on Yellowstone National Park Project 5(1) East Entrance Yellowstone, National Park State of Wyoming." Office of Division of Maintenance, Yellowstone National Park.

26.Real Property Records for Yellowstone National Park, East Entrance Road. "Project Summary. East Entrance Guardrail, Yellowstone National Park." Office of Division of Maintenance, Yellowstone National Park.

27."Parkwide Road Engineering Study of the Yellowstone National Park Road System, Draft Report, October 1986," vol. I. U.S. Department of Transportation, Federal Highway Administration, Vancouver, Washington, 1986.

28.J.W. Johnson, District Engineer, Bureau of Public Roads to Dr. L.I. Hewes, Deputy Chief Engineer, Bureau of Public Roads, 24 November 1926.

29. T.C. Vint, National Park Service Chief Landscape Architect, to Horace Albright, Superintendent, Yellowstone National Park, 9 September 1927.

30.T.C. Vint, National Park Service Chief Landscape Architect, to C.F. Capes, Bureau of Public Roads Engineer, 23 July 1928.

BIBLIOGRAPHY

PUBLISHED PUBLIC DOCUMENTS

Chittenden, Hiram M. *Report Upon the Construction, Repairs, and Maintenance of Roads and Bridges in the Yellowstone National Park and Construction of Military Road from Fort Washakie to Mouth of Buffalo Fork of the Snake River, Wyoming and Erection of Monument to Sergeant Charles Floyd.* Appendices FFF, III, and JJJ of the (Annual Report of Chief of Engineers for 1901). Washington D.C.: Government Printing Office, 1901.

____. *Improvement of Yellowstone National Park, Including the Construction, Repair and Maintenance of Roads and Bridges. (Annual Report of the Chief of Engineers for 1902,* Appendix FFF.) Washington D.C.: Government Printing Office, 1902.

Chittenden, Hiram M. and Mills, John. *Annual Report Upon the Construction, Repair, and Maintenance of Roads and Bridges in the Yellowstone National Park and the Road Into Mount Rainier National Park; Survey for Wagon Road From Valdes to Fort Egbert, Alaska, and Survey for Military Trail Between Yukon River and Coldfoot, Alaska,* Appendices FFF and DDD of the *(Annual Report of the Chief of Engineers for 1905).* Washington D.C.: Government Printing Office, 1905.

Knight, Captain C.H., Cavanaugh, Major J.D., and Morrow, Major Jay. *Report Upon the Construction, Repair, and Maintenance of Roads and Bridges in the Yellowstone National Park; Report Upon the Road Into Mount Rainier National Park; and Report Upon Crater Lake National Park,* Appendices EEE and FFF. Washington D.C.: Government Printing Office, 1913.

Mather, Stephen. *Report of the Director of the National Park Service to the Secretary of the Interior for the Fiscal Year Ended June 30, 1917.* Washington D.C.: Government Printing Office, 1917.

Peek, First Lieutenant Ernest D. and Captain Hiram Chittenden. *Report Upon the Construction, Repairs, and Maintenance of Roads and Bridges in the Yellowstone National Park and Report Upon the Road Into Mount Rainier National Park. (Annual Report of the Chief of Engineers for 1906.)* Washington D.C.: Government Printing Office, 1906.

Willing, 1st Lieutenant Wildurr and Kutz, Major C.W. *Report Upon the Construction, Repair, and Maintenance of Roads and Bridges in the Yellowstone National Park, and Report Upon the Road Into Mount Rainier National Park.* Appendices GGG and HHH. Washington D.C.: Government Printing Office, 1909.

NEWSPAPER ARTICLES

Sheridan Post Enterprise, 30 October 1927.

UNPUBLISHED PUBLIC DOCUMENTS

____. The Organic Act, Creating Yellowstone National Park, Approved March 1, 1872.

____. Real Property Records for Yellowstone National Park, East Entrance Road, "Project Summary, East Entrance Guardrail, Yellowstone National Park." Division of Maintenance, Yellowstone National Park.

Albright, Horace. "Superintendent, Yellowstone National Park to Stephen Mather, Director of the National Park Service, July 29, 1925."

Capes, C.S. "Traffic Survey Report Intra-Part Travel Season 1937, Yellowstone National Park, Wyoming, September 20, 1937."

Cowan, E.H. "Final Construction Report (1936-1937) on Grand Loop 1-E1, Parking Area, and East Entrance, (Fishing Bridge) 5-D1, Part D22, Bridge, Approaches, Surface and Secondary Roads. Yellowstone National Park, Wyoming." Bureau of Public Roads, U.S. Department of Agriculture.

____. "Final Construction Report (1939-1940) on Grand Loop National Park Project 1-E1, Part F1, and East Entrance National Park Project 5-D1, D2, Part C, Bituminous Surfacing Yellowstone National Park, State of Wyoming, March 11, 1941."

Demaray, A.E. Acting Director, National Park Service. Letter to Wyoming Congressman, John J. McIntyre, 22 April 1941.

"Final Construction Project (1965-1966) on Yellowstone National Park Project 5 (1) East Entrance, Yellowstone Park, State of Wyoming."

Johnson, J.W., District Engineer, Bureau of Public Roads. Letter to Dr. L.I. Hewes, Deputy Chief Engineer, Bureau of Public Roads, November 24, 1926

Lane, Franklin. "Secretary of the Interior to Senator Francis Warren, 29 January 1920."

Mattson, Frank, Robert Hall, and Robert Albers Jr. "Report to the Chief Architect Through the Superintendent Yellowstone National Park for the Period September 28 to October 28, 1934."

____. "Memorandum to C. Capes, Landscape Architect, August 1, 1935."

"Monthly Narrative Report, July 31, 1928, of Yellowstone National Park, District No. 3."

"Monthly Narrative Report, September 30, 1928, of Yellowstone National Park, District No. 3."

"Monthly Narrative Report, June 30, 1929, of Yellowstone National Park, District No. 3."

"Monthly Narrative Report, July 31, 1930, Yellowstone National Park, District No. 3."

"Monthly Narrative Report, July 31, 1930, Yellowstone National Park, District No. 3."

"Parkwide Road Engineering Study, Yellowstone National Park," Vol. I. U.S. Department of Transportation Federal Highway Administration, Western Direct Federal Division, Vancouver, Washington, 1986.

"Proposed Road Projects for 1923." No Author. No Date.

"Real Property Records for Yellowstone National Park, East Entrance Road."

Vint, T.C. "Memorandum to Horace Albright, Superintendent, Yellowstone National Park, from Chief Landscape Architect, September 9, 1927."

____. "Memorandum to Bureau of Public Roads Engineer, C.F. Capes, July 23, 1928."